Math Sci (2016) 10:63–64
DOI 10.1007/s40096-016-0174-0

COMMENT

Comments on "Soft *b*-open sets and soft *b*-continuous functions, Math. Sci. (2014) 8:124"

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Received: 26 May 2015 / Accepted: 7 January 2016 / Published online: 16 February 2016

In Example 1 of [1], the authors concluded that (X, τ, E) is a soft topological space over the universe $X = \{h_1, h_2, h_3, h_4\}$ and the set of parameters $E = \{e_1, e_2, e_3\}$. Actually, their conclusion is not correct where $(F_1, E), (F_2, E) \in \tau$ leads to $(F_1, E)\tilde{\cap}(F_2, E) \notin \tau$ and $(F_1, E)\tilde{\cup}(F_2, E) \notin \tau$. Also, this is achieved for another soft sets like (F_1, E) and (F_{14}, E). As a result of this flaw, Examples 2, 6, 7 and 8 in [1] are not correct. Examples 1 and 2 achieve the goal of Examples 1 and 2 in [1].

Example 1 Let $X = \{h_1, h_2, h_3, h_4\}$ and $E = \{e_1, e_2\}$.

(1) If $\tau_1 = \{\tilde{\emptyset}, \tilde{X}, (F_1, E), (F_2, E), (F_3, E)\}$ is a soft topology where (F_1, E), (F_2, E), (F_3, E) and (F, E) are soft sets over X defined by:

$$F_1(e_1) = \{h_1\}, \quad F_1(e_2) = \{h_1\},$$
$$F_2(e_1) = \{h_2\}, \quad F_2(e_2) = \{h_2\},$$
$$F_3(e_1) = \{h_1, h_2\}, \quad F_3(e_2) = \{h_1, h_2\}.$$

and

$$F(e_1) = \{h_1, h_3\}, \quad F(e_2) = \{h_1, h_3\}.$$

Then (F, E) is s*b*-open set but not s*p*-open set.

(2) If $\tau_2 = \{\tilde{\emptyset}, \tilde{X}, (F_1, E), \ldots, (F_7, E)\}$ is a soft topology where (F_1, E), …, (F_7, E) and (H, E) are soft sets over X defined by:

$$F_1(e_1) = \{h_1, h_2\}, \quad F_1(e_2) = \{h_1, h_2\},$$
$$F_2(e_1) = \{h_2\}, \quad F_2(e_2) = \{h_1, h_3\},$$
$$F_3(e_1) = \{h_2, h_3\}, \quad F_3(e_2) = \{h_1\},$$
$$F_4(e_1) = \{h_2\}, \quad F_4(e_2) = \{h_1\},$$
$$F_5(e_1) = \{h_1, h_2\}, \quad F_5(e_2) = X,$$
$$F_6(e_1) = X, \quad F_6(e_2) = \{h_1, h_2\},$$
$$F_7(e_1) = \{h_2, h_3\}, \quad F_7(e_2) = \{h_1, h_3\}.$$

and

$$H(e_1) = \emptyset, \quad H(e_2) = \{h_1\}.$$

Then (H, E) is s*b*-open set but not s*s*-open set.

Example 2 Let $\mathbb{R}$ be the set of the real numbers and $E = \{e\}$ be the parameters set. Define the usual soft topology over $\mathbb{R}$ with respect to E. Let (F, E) be a soft set over $\mathbb{R}$ defined by $F(e) = [0, 1) \cap \mathbb{Q}$ where $\mathbb{Q}$ is the set of rational numbers, then (F, E) is sβ-open set but not s*b*-open set.

The following two examples meet the purpose of Examples 6, 7 and 8 in [1].

Example 3 Let $X = \{h_1, h_2, h_3, h_4\}$, $Y = \{m_1, m_2, m_3, m_4\}$, $E = \{e_1, e_2\}$ and $K = \{k_1, k_2\}$.

1. If (X, τ_1, E) is a soft topological space defined as in Example 1(1), (Y, ν_1, K) be a soft topological space defined over Y where $\nu_1 = \{\tilde{\emptyset}, \tilde{Y}, (L_1, K)\}$ and (L_1, K) is a soft set on Y defined by:

$$L_1(k_1) = \{m_1, m_2\}, \quad L_1(k_2) = \{m_1, m_2\}.$$

Let $f : (X, \tau_1, E) \to (Y, \nu_1, K)$ be a soft function defined by

$$u(h_1) = m_2, \quad u(h_2) = m_4, \quad u(h_3) = m_1, \quad u(h_4) = m_3,$$
$$p(e_1) = k_2, \quad p(e_2) = k_1.$$

This comment refers to the original article with article doi:10.1007/s40096-014-0124-7 (Math Sci (2014) 8:124).

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Then f is soft b-continuous function but not soft pre-continuous.

2. If (X, τ_2, E) is a soft topological space defined as in Example 1(2), (Y, v_2, K) is a soft topological space defined over Y where $v_2 = \{\tilde{\emptyset}, \tilde{Y}, (L_2, K)\}$ and (L_2, K) is a soft set on Y defined by:

   $L_2(k_1) = \{m_2\}, \quad L_2(k_2) = \emptyset.$

   Let $f : (X, \tau_1, E) \to (Y, v_2, K)$ be a soft function defined as in (1), then f is soft b-continuous function but not soft semi-continuous.

Example 4 Let $\mathbb{R}$ be the set of real numbers, $E = \{e\}$, $K = \{k\}$, $(\mathbb{R}, \mathcal{U}, E)$ be the usual soft topology and $(\mathbb{R}, \mathcal{V}, K)$ be a soft topology over $\mathbb{R}$ such that $\mathcal{V} = \{\tilde{\emptyset}, \tilde{R}, (M, K)\}$ where (M, K) is a soft set defined over $\mathbb{R}$ by $M(k) = [0, 1) \cap \mathbb{Q}$. Define the maps $u : \mathbb{R} \to \mathbb{R}$ and $p : E \to K$ by

$$u(x) = \begin{cases} x, & \text{if } x \in [0, 1) \cap \mathbb{Q}; \\ 0, & \text{otherwise.} \end{cases}$$

and $p(e) = k$. Then $f^{-1}(M, K) = (H, E)$ where $H(e) = [0, 1) \cap \mathbb{Q}$. Thus f is soft β-continuous function but not soft b-continuous.

References

1. Akdağ, Metin, Ozkan, Alkan: Soft b-open sets and soft b-continuous functions. Math. Sci. **8**, 124 (2014)